Managing ACE Software Licenses

This chapter describes how to manage the software licenses for your Cisco 4700 Series Application Control Engine (ACE) appliance. It contains the following major sections:

- Available ACE Licenses
- Ordering an Upgrade License and Generating a Key
- Copying a License File to the ACE
- Installing a New or Upgrade License File
- Replacing a Demo License with a Permanent License
- Removing a License
- Backing Up a License File
- Displaying License Configurations and Statistics

Note You can access the **license** and **show license** commands only in the Admin context. You must have the Admin role in the Admin context to install, remove, and update the license file.

Available ACE Licenses

By default, the ACE supports the following features and capabilities:

- Performance: 1 gigabit per second (Gbps) appliance throughput

- Virtualization: 1 admin context and 5 user contexts

- Secure Sockets Layer (SSL): 1000 transactions per second (TPS)

- Hypertext Transfer Protocol (HTTP) compression: 100 megabits per second (Mbps)

You can increase the performance and operating capabilities of your ACE product by purchasing one of the licensing options.

There are two methods to order your ACE product:

- Ordering a license bundle. Each license bundles includes the ACE appliance and a series of software licenses.

- Ordering separate license options.

Table 3-1 summarizes the contents of the available license bundles. Table 3-2 provides a list of the default and upgrade ACE appliance licensing options.

Table 3-1   ACE Licensing Bundles

License Model	Description
ACE-4710-2F-K9	This license bundle includes the following items: • ACE 4710 appliance • 2 Gbps throughput license • 7500 SSL transactions per second (TPS) license • 1 Gbps compression license • 5 virtual contexts license (default) • Application acceleration license (50 connections)
ACE-4710-1F-K9	This license bundle includes the following items: • ACE 4710 appliance • 1 Gbps throughput license • 5000 SSL TPS license • 500 Mbps compression license • 5 virtual contexts license (default) • Application acceleration license (50 connections)

Table 3-2   ACE Licensing Options

Feature	License Model	Description
Performance Throughput	ACE-AP-01-LIC (default)	1-Gbps throughput.
	ACE-AP-02-LIC	2-Gbps throughput.
	ACE-AP-04-LIC	4-Gbps throughput.
	ACE-AP-02-UP1	Upgrade from 1-Gbps to 2-Gbps throughput.
	ACE-AP-04-UP1	Upgrade from 1-Gbps to 4-Gbps throughput.
	ACE-AP-04-UP2	Upgrade from 2-Gbps to 4-Gbps throughput.
Virtualization	Default	1 admin/5 user contexts.
	ACE-AP-VIRT-020	1 admin/20 user contexts.
SSL	Default	1000 TPS.
	ACE-AP-SSL-05K-K9	5000 TPS.
	ACE-AP-SSL-07K-K9	7500 TPS.
	ACE-AP-SSL-UP1-K9	Upgrade from 5000 TPS to 7500 TPS.
HTTP Compression	Default	100-Mbps.
	ACE-AP-C-500-LIC	500-Mbps.
	ACE-AP-C-1000-LIC	1-Gbps.
	ACE-AP-C-2000-LIC	2-Gbps.
	ACE-AP-C-UP1	Upgrade from 500 Mbps to 1 Gbps.
	ACE-AP-C-UP2	Upgrade from 500 Mbps to 2 Gbps.
	ACE-AP-C-UP3	Upgrade from 1 Gbps to 2 Gbps.

Table 3-2   ACE Licensing Options

Feature	License Model	Description
Application Acceleration Feature Pack License	ACE-AP-OPT-LIC-K9	Application acceleration and optimization. By default, the ACE performs up to 50 concurrent connections. With the application acceleration and optimization software feature pack installed, the ACE can provide greater than 50 concurrent connections. This license increases the operating capabilities of the following features: • Delta optimization • Adaptive dynamic caching • Flashforward • Dynamic Etag

ACE demo licenses are available through your Cisco account representative. A demo license is valid for only 60 days. At the end of this period, you must update the demo license with a permanent license to continue to use the ACE software. To view the expiration of a demo license, use the **show license usage** command in Exec mode.

Note   If you need to replace the ACE, you can copy and install the license file for the license onto the replacement appliance.

Ordering an Upgrade License and Generating a Key

This section describes the process that you use to order an upgrade license and to generate a license key for your ACE. To order an upgrade license, perform the following steps:

Step 1   Order one of the licenses from the list in Table 3-2 using any of the available Cisco ordering tools on cisco.com.

Step 2   When you receive the Software License Claim Certificate from Cisco, follow the instructions that direct you to the following Cisco.com website:

http://www.cisco.com/go/license

Step 3   Enter the Product Authorization Key (PAK) number found on the Software License Claim Certificate as your proof of purchase.

Step 4   Provide all the requested information to generate a license key.

Step 5   Once the system generates the license key, you will receive a license key e-mail with an attached license file and installation instructions. (The installation instructions are also described in the "Copying a License File to the ACE" section of this chapter.) Save the license key e-mail in a safe place in case you need it in the future (for example, to transfer the license to another ACE).

Copying a License File to the ACE

When you receive the software license key e-mail from Cisco Systems, you must copy the attached license file to a network server. Then use the **copy** command in Exec mode from the Admin context to copy the file from the network server to disk0: on the ACE. For detailed information on the copying files from a remote server, see Chapter 4, Managing the ACE Software.

For example, the syntax of the **copy tftp** command is:

> **copy tftp:**[*//server*[*/path/*][*/filename*]] **disk0:**[*path/*]*filename*

The arguments are:

- [*//server*[*/path/*][*/filename*]]—The path to the network server. This path is optional because the ACE prompts you for this information if you omit it.

- **disk0:**[*path/*]*filename*—Specifies that the file destination is the disk0: directory of the current context and the filename. If you do not provide the optional path, the ACE copies the file to the root directory on the disk0: file system.

For example, to copy the ACE-AP-VIRT-020.lic license file from the license directory on the track network server to the root directory on disk0:, enter:

```
host1/Admin# copy tftp://track/license/ACE-AP-VIRT-020.lic disk0:
```

If the license is a demo or permanent license for a new or upgrade installation, see the "Installing a New or Upgrade License File" section.

If the license is a permanent license replacing a demo license, see the "Replacing a Demo License with a Permanent License" section.

Installing a New or Upgrade License File

After you copy a demo or permanent license file to the ACE for a new or upgrade installation, you can install it. All license installations except one have no adverse impact to an operating ACE. No reboot is required and existing connections are not interrrupted. In a redundant configuration, mismatched context licenses cause the active ACE to generate a syslog message if logging is enabled and to disable configuration synchronization. After you install the correct matching license on the standby ACE, the software automatically detects the license and restores normal operation. For information on replacing a demo license with a permanent one, see the "Replacing a Demo License with a Permanent License" section.

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Caution   If you install a context demo license, make sure that you save the Admin running configuration and all user context running configurations to a remote server. If you allow a context license to expire, the ACE automatically removes all user contexts from the Admin running configuration and all configurations for the user contexts.

To install or upgrade a license on your ACE, use the **license install disk0:** command in Exec mode from the Admin context. The syntax of this command is:

> **license install disk0:**[*path*/]*filename* [*target_filename*]

The arguments are:

- [*path*/]*filename*—Installs the license stored on the disk0: file system. If you do not specify the optional path, the ACE looks for the file in the root directory.
- *target_filename*—(Optional) Target filename for the license file.

For example, to install the 2 Gbps appliance throughout performance license, enter:

```
host1/Admin# license install disk0:ACE-AP-02-LIC.lic
```

To install a license file for an SSL 5000 TPS license, enter:

```
host1/Admin# license install disk0:ACE-AP-SSL-05K-K9.lic
```

To install a license file for a 20 context license, enter:

```
host1/Admin# license install disk0:ACE-AP-VIRT-020.lic
```

Replacing a Demo License with a Permanent License

The ACE demo license is valid for only 60 days. Four weeks before the license expires, the ACE generates warning syslog messages once a day. During the final week, a warning syslog message occurs once an hour. Before this period ends, you must update the demo license with a permanent license. Otherwise, the ACE will revert to its previous throughout performance, SSL TPS, or number of contexts.

⚠

Caution   If you replace the context demo license with a permanent license, you can continue to use the configured user contexts on the ACE. However, if you allow a context license to expire, the ACE automatically removes all user contexts from the Admin running configuration and all configurations for the user contexts. Before a context license expires, save the Admin running configuration and the user context running configurations to a remote server.

To view the expiration of the demo license, use the **show license usage** command in Exec mode from the Admin context.

After you copy the permanent license file to the ACE, you can install it. To replace a demo license with a permanent license, use the **license update disk0:** command in Exec mode from the Admin context. The syntax of this command is:

license update disk0:[*path*/]*permanent_filename demo_filename*

The keyword and arguments are:

- [*path*/]*permanent_filename*—Filename for the permanent license file that you copied onto the ACE.

- *demo_filename*—Filename for the demo license file that the permanent license file is replacing.

For example, enter:

```
host1/Admin# license update disk0:ACE-AP-VIRT-020.lic
ACE-AP-VIRT-020-DEMO.lic
```

Removing a License

To remove an installed license, use the **license uninstall** command in Exec mode from the Admin context. The syntax for this command is:

   license uninstall *license_filename*

The *license_filename* argument specifies the filename of the license file that you want to remove. Enter the license filename as an unquoted text string with no spaces.

Note   When you enter the **clear startup-config** or the **write erase** command, the ACE does not remove license files from the startup-configuration file. You must use the **license uninstall** command to remove license files from the ACE.

The following sections provides information about how to remove licences:

- Removing an Appliance Performance Throughput License
- Removing an SSL TPS License
- Removing a Virtualization Context License
- Removing an HTTP Compression Performance License
- Removing the Application Acceleration Software Feature Pack License

Caution   When you remove a demo or permanent virtual context license, the ACE removes all user contexts from the Admin running configuration. By removing the user contexts, their running and startup configurations are also removed from the ACE. Before removing any virtual context license, save the Admin running configuration and the user context running configurations to a remote server. For more information, see the "Removing a Virtualization Context License" section.

Removing an Appliance Performance Throughput License

To remove a performance throughput license, use the **license uninstall** command in Exec mode from the Admin context. Table 3-4 lists the currently installed performance throughput, the type of license on the ACE, and the remaining number of context after the license is removed.

Table 3-3   Performance Throughput License Removal

Current performance throughput	Applicable licenses	Results of license removal
1-Gbps throughput	Not applicable	—
2-Gbps throughput	ACE-AP-02-LIC	1-Gbps throughput
4-Gbps throughput	ACE-AP-04-LIC	1-Gbps throughput
	ACE-AP-02-UP1	1-Gbps throughput
	ACE-AP-04-UP1	1-Gbps throughput
	ACE-AP-04-UP2	2-Gbps throughput

For example, to remove a performance throughput license, enter:

```
host1/Admin# license uninstall ACE-AP-04-LIC.lic
```

Removing an SSL TPS License

To remove an ACE SSL TPS license, use the **license uninstall** command in Exec mode from the Admin context. When you uninstall an SSL license, it reduces SSL TPS performance to 1000 TPS on the ACE.

For example, to remove an SSL TPS license, enter:

```
host1/Admin# license uninstall ACE-AP-SSL-05K-K9.lic
```

Removing a Virtualization Context License

The number of virtual contexts and type of licenses currently installed on the ACE determines which license you can remove. Table 3-4 lists the currently installed contexts, the type of license on the ACE, and the remaining number of context after the license is removed.

Table 3-4   VIrtual Context License Removal

Current number of contexts	Applicable licenses	Results of license removal
5 (default)	Not applicable	—
20	ACE-AP-VIRT-020	5 contexts

⚠
Caution   When you remove a demo or permanent virtual context license, the ACE removes all user contexts from the Admin running configuration. By removing the user contexts, their running and startup configurations are also removed from the ACE. Before removing any virtual context license, save the Admin running configuration and the user context running configurations to a remote server.

To remove a context license, perform the following steps:

Step 1   Save the Admin and user context running configurations to a remote server by entering the **copy running-config** command in Exec mode in each context. For more information on this command, see Chapter 4, Managing the ACE Software.

For example, to copy the Admin running configuration to an TFTP server as R-CONFIG-ADM, enter:

```
host1/Admin# copy running-config tftp://192.168.1.2/R-CONFIG-ADM
```

To copy the C1 user context running configuration to an TFTP server, access the C1 context and enter:

```
host1/C1# copy running-config tftp://192.168.1.2/R-CONFIG-C1
```

Step 2   Remove the license with the **license uninstall** command. For example, to remove the ACE-AP-VIRT-020.LIC license, enter:

```
host1/Admin# license uninstall ACE-AP-VIRT-020.lic
```

The ACE displays the following messages and prompt:

```
Clearing license ACE-AP-VIRT-020.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT ACE-AP-VIRT-020 cisco 1.0 permanent 1 \
        VENDOR_STRING=<count>1</count> HOSTID=ANY \

NOTICE="<LicFileID>20051103151315824</LicFileID><LicLineID>1</LicLineI
D> \
        <PAK></PAK>" SIGN=86A13B1EA2F2


INCREMENT ACE-AP-VIRT-020 cisco 1.0 permanent 1 \
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!! WARNING: Uninstalling virtual context license will automatically!!
!!! cleanup all the user context configurations, please backup the  !!
!!! configurations before proceeding further with uninstallation    !!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Do you want to continue? (y/n)
```

Step 3   If you have not saved the running configurations for the Admin and user contexts to a remote server, enter **n**. Go to Step 1

If you saved the running configurations for the Admin and user contexts to a remote server, enter **y**.

During the license removal, the ACE removes the user context configurations from the Admin running configuration, causing the deletion of all user contexts including their running and startup configurations.

Step 4   Display the current number of supported contexts on the ACE by entering the **show license status** command in Exec mode of the Admin context.

Step 5   Determine which contexts you want to keep in the Admin running configuration. Using a text editor, manually remove the extra context configurations from the Admin running configuration on the remote server.

If the Admin running configuration contains more contexts than what the ACE supports and you copy this configuration to the ACE, the ACE rejects contexts that exceed the supported limit. For example, if the running configuration contains 20 contexts, when you remove the license, the ACE supports five contexts. If you attempt to copy the configuration with all 20 contexts, the ACE allows the first five contexts, fails the remaining contexts, and displays error messages on the console.

Note You can also manually recreate the user contexts in the running configuration that is currently on the ACE. If you do, go to Step 7

Step 6 Retrieve the modified Admin running configuration from the remote server. For example, to copy the R-CONFIG-ADM Admin running configuration from the TFTP server, enter:

```
host1/Admin# copy tftp://192.168.1.2/R-CONFIG-ADM running-config
```

Step 7 Copy the Admin running configuration to the startup-configuration file. For example, enter:

```
host1/Admin# copy running-config startup-config
```

Note If you do not update the startup configuration with the latest running configuration, when the ACE restarts, it uses the startup configuration with the extra contexts. The ACE allows the number of contexts that the license supports, but fails the remaining contexts.

Step 8 Access the user context, and copy its running configurations from the remote server. For example, to copy the C1 user context running configuration from the TFTP server, access the C1 context and enter:

```
host1/C1# tftp://192.168.1.2/R-CONFIG-C1 copy running-config
```

Step 9 Copy the user context running configuration to the startup-configuration file. For example, enter:

```
host1/Admin# copy running-config startup-config
```

Step 10 Repeat Steps 8 and 9 until you retrieve the running configurations for all user contexts configured in the Admin configuration.

Removing an HTTP Compression Performance License

To remove an ACE HTTP compression performance license, use the **license uninstall** command in Exec mode from the Admin context. The current compression capability and type of compression licenses currently installed on the ACE determines which license you can remove. Table 3-5 lists the currently installed compression license on the ACE and the remaining compression capability after the license is removed.

Table 3-5   Compression License Removal

Current compression capability	Applicable licenses	Results of license removal
100 Mbps (default)	Not applicable	—
500 Mbps	ACE-AP-C-500-LIC	100 Mbps
1 Gbps	ACE-AP-C-1000-LIC	100 Mbps
	ACE-AP-C-UP1	500 Mbps
2 Gbps	ACE-AP-C-2000-LIC	100 Mbps
	ACE-AP-C-UP2	500 Mbps
	ACE-AP-C-UP3	1 Gbps

For example, to remove an HTTP compression license, enter:

```
host1/Admin# license uninstall ACE-APP-C-2000-LIC.lic
```

Removing the Application Acceleration Software Feature Pack License

To remove the application acceleration software feature pack, use the **license uninstall** command in Exec mode from the Admin context. With the application acceleration software feature pack installed, the ACE can support approximately 1,000 concurrent connections under typical usage scenarios. When you uninstall the software feature pack, the ACE is capable of 50 connections per second. For more information on the application acceleration and optimization capabilities of the ACE and configuring these capabilities, see the *Cisco 4700 Series Application Control Engine Appliance Application Acceleration and Optimization Configuration Guide*.

For example, to remove the license for the application acceleration software feature pack, enter:

```
host1/Admin# license uninstall ACE-AP-OPT-LIC-K9.lic
```

Backing Up a License File

To safeguard your license files, we recommend that you back up your license files to the ACE Flash disk as tar files. To back up license files in .tar format, use the **copy licenses** command in Exec mode from the Admin context. The syntax for this command is:

copy licenses disk0:[*path*/]*filename***.tar**

The keyword and argument are:

- **disk0:**—Specifies that the backup license file is copied to the disk0: file system.
- [*path*/]*filename***.tar**—The destination filename for the backup licenses. The destination filename must have a .tar file extension.

For example, enter:

```
host1/Admin# copy licenses disk0:mylicenses.tar
```

If you accidently remove or lose the license on the ACE, you can untar the backup file and reinstall it. To untar the license, use the **untar** command in Exec mode. The syntax for this command is:

untar disk0:[*path/*]*filename***.tar**

The [*path/*]*filename***.tar** argument is the filename of the .tar backup license file.

For example, to untar the mylicenses.tar file on disk0:, enter:

```
host1/Admin# untar disk0:mylicenses.tar
```

For information on installing the license, see the "Installing a New or Upgrade License File" section.

Displaying License Configurations and Statistics

This section describes the **show** commands that you can use to display license information about your ACE. To display license information, use the **show license** command in Exec mode from the Admin context. The syntax for this command is:

> **show license brief** | **file** *filename* | **internal event-history** | **status** | **usage**

The options and arguments for this command are:

- **brief**—Displays a list of the currently installed licenses
- **file** *filename*—Displays the file contents of the specified license
- **internal event-history**—Displays a history of licensing-related events
- **status**—Displays the status of licensed features
- **usage**—Displays the usage table for all licenses

Note   Entering the **show license** command without any options and arguments displays all installed ACE license files and their contents.

For example, to display a list of the current installed licenses, enter

```
host1/Admin# show license brief
ACE-AP-VIRT-020.lic
ACE-AP-04-LIC.lic
ACE-APP-C-2000-LIC.lic
ACE-AP-OPT-LIC-K9.lic
ACE-AP-SSL-10K-K9.lic
```

Table 3-6 describes the fields in the **show license status** command output.

Table 3-6   Field Descriptions for the show license status Command Output

Field	Description
Licensed Feature	List including the ACE virtualized contexts, the SSL transactions per second, and the appliance throughout performance feature.
Count	Number of ACE supported contexts, SSL transactions per second (TPS), and throughput in gigabits per second (Gbps). This information also provides the default number of contexts, SSL TPS, and appliance throughout that the ACE supports when a license is not installed.

Table 3-7 describes the fields in the **show license usage** command output.

Table 3-7   Field Descriptions for the show license usage Command Output

Field	Description
License	Name of the license.
Ins	Whether the license is installed (Yes or No).
Lic Count	Number of licenses for this feature.
Status	Current state of the feature (In use or Unused).
Expiry Date	Date when the demo license expires, as defined in the license file. If the license is permanent, this field displays never.
Comments	Licensing errors, if any.

You can also view the ACE license by using the **show version** command in Exec mode on the ACE.

■ **Displaying License Configurations and Statistics**